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Compounded trout fish feeds — Specification

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Foreword

Rwanda Standards are prepared by Technical Committees and approved by Rwanda Standards Board (RSB) Board of Directors in accordance with the procedures of RSB, in compliance with Annex 3 of the WTO/TBT agreement on the preparation, adoption and application of standards.

The main task of technical committees is to prepare national standards. Final Draft Rwanda Standards adopted by Technical committees are ratified by members of RSB Board of Directors for publication and gazettment as Rwanda Standards.

DRS 634 was prepared by Technical Committee RSB/TC 008, *Animal feeding stuffs.*

In the preparation of this standard, reference was made to the following standard:

KS 871:2018, Compounded trout fish feeds - Specification

The assistance derived from the above source is hereby acknowledged with thanks.

Committee membership

The following organizations were represented on the Technical Committee on *Animal feeding stuffs* (RSB/TC 08) in the preparation of this standard.

Paragraph of participants

Gatsibo Food Processing Company (GFPC) Ltd

Innovation in Production (INNOPRO) Ltd

National Industrial Research and Development Agency (NIRDA)

Red black Ltd

Rwanda Best Ltd

Rwanda Inspectorate, Competition and Consumer Protection Authority (RICA)

Sakaza Fruit Processing Ltd

University of Rwanda - College of Agriculture, Animal Sciences and Veterinary Medicine (UR-CAVEM)

Rwanda Standards Board (RSB) – Secretariat

Compounded trout fish feeds — Specification

1 Scope

This Draft Rwanda Standard specifies requirements for dry compounded trout feeds used as a complete diet and serving as the only source of nutrients for cultured trout species.

This standard shall apply to the following types of trout diets:

a) Starter diets — For small fry and fingerlings of length up to 7.5 cm.

b) Grower diets — For medium-sized trout (7.6 cm — 22.5 cm).

c) Brood stock diets — For large-sized trout (more than 22.6 cm).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

RS ISO 9831, *Animal feeding stuffs, animal products, and faeces or urine — Determination of gross calorific value — Bomb calorimeter method*

RS ISO 5983-1, *Animal feeding stuffs — Determination of nitrogen content and calculation of crude protein content — Part 1: Kjeldahl method*

RS ISO 13903, *Animal feeding stuffs — Determination of amino acids content*

RS ISO 6496, *Animal feeding stuffs — Determination of moisture and other volatile matter content*

RS ISO 6865, *Animal feeding stuffs — Determination of crude fibre content — Method with intermediate filtration*

RS ISO 6492, *Animal feeding stuffs — Determination of fat content*RS ISO 5985*, Animal feeding stuffs — Determination of ash insoluble in hydrochloric acid*

RS ISO 6490-1, *Animal feeding stuffs — Determination of calcium content — Part 1: Titrimetric method*

RS ISO 6491, *Animal feeding stuffs — Determination of phosphorus content — Spectrometric method*

RS ISO 6497, *Animal feeding stuffs — Sampling*

RS ISO 17375, *Animal feeding stuffs — Determination of aflatoxin B1*

RS ISO 16050, *Foodstuffs — Determination of aflatoxin B1, and the total content of aflatoxins B1, B2, G1 and G2 in cereals, nuts and derived products — High-performance liquid chromatographic method*

3 Terms and definitions

For the purposes of this standard, the following terms and definitions apply

3.1

trout

any fish of the family *salmonidae*. Commonly known species include rainbow trout, brown trout and brook trout

3.2

palatable

of reasonable hardness and free of compounds that are offensive to the olfactory receptors of the fish

3.3

feedable

water stable (resistant to sudden crumbling) and float long enough in water to be accessible

3.4

fines

particles passing through a 420 µm screen or 0.42 mm (1 mm = 1 000 µm)

4 General requirements

4.1 Compounded trout feeds may be in the form of mash, crumbles and pellets.

4.2 Regarding Mash, crumble and pellets sizes, they shall comply with the size specifications given in Tables 1 and 2.

Table 1 — Mash and crumble size for fry and fingerlings (starter diet)

Length of trout, cm	Mash and crumble size, mm	Size tolerance diameter, %
Less than or equal to 3.5	0.3 to 0.5 (mash)	-
3.51 ─ 5	1 ─ 1.2	10

5.1 — 7.5	1.5 — 1.8	10

Table 2 — Pellet size for growers and breeders

Length of trout, cm	Pellet size, mm	Size tolerance diameter, %
7.51 — 15	2 — 2.2	10
15.1 — 15.5	3 — 3.2	10
15.51 — 22.5	4 — 2.2	10
22.51 and above	8	10

4.3 The dietary protein and lipid in Compounded trout feeds shall be formulated according to the fish size and growth stage as shown in Table 3

Table 3 — Compositional requirements for dietary protein and lipid in compounded trout feeds according to fish size and growth stage

Growth stage	Fish weight (g)	Protein (%)	Lipid (%)	Energy (MJ /Kg)
Fry	0.3 - 0.5	58	15	21.6
Fingerlings	1 - 3	56	18	22
	15 - 50	45	23	23.1
Grower	50 - 100	42 - 45	24 - 27	23.1
	100 - 450	41 - 44	25 - 28	23.5 - 25.5
	450 - 1000	40 - 43	25 - 28	23.5 - 25.5

4.4 The feeds shall be free from pathogenic bacteria and metallic objects.

4.5 The feeds shall be palatable and feedable.

4.6 The feeds shall be free of mouldy growth and rancidity, which is indicative of spoilage.

4.7 For crumbs and pellets, the total content of 'fines' shall not exceed 3 % by weight.

4.8 All the additives and preservatives used in the feeds shall be only the ones recommended by the World Organization for Animal Health (WOAH).

5 Nutrient requirements

5.1 Compounded trout feeds shall comply with the compositional requirements specified in Table 4 when tested in accordance with the test methods specified therein.

5.2 The feeds shall contain vitamins and minerals specified in Table A.1.

Table 4 — Compositional requirements for compounded trout feeds

S/N	Parameter	Starter diet	Grower diet	Brood-stock	Test method
i)	Energy (digestible energy), min, kJ/kg	15 500	15 500	15 500	RS ISO 9831
ii)	Crude protein, %, min.	45	40	35	RS ISO 5983-1
iii)	Amino acids: a) Methionine b) Lysine c) Threonine	 1 1.4 0.8	 1 1.4 0.8	 1 1.4 0.8	RS ISO 13903
iv)	Moisture, %, max.	10	10	10	RS ISO 6496
v)	Crude fibre, %, max.	4	4	4	RS ISO 6865
vi)	Crude fat, %	15 – 20	10 – 15	10 – 15	RS ISO 6492
vii)	Acid insoluble ash, %, max.	4	4	4	RS ISO 5985

viii)	Calcium, %, max.	1	1	1	RS ISO 6490-1
ix)	Phosphorus, %, min.	0.8	0.7	0.6	RS ISO 6491

6 Contaminants

6.1 Aflatoxins

Compounded trout feeds shall not exceed the aflatoxin limits given in Table 5 when tested in accordance with the test methods specified therein.

Table 5 — Maximum limits for aflatoxin in compounded trout feed

S/N	Aflatoxin	Maximum limit µg/kg	Test method
i.	Total aflatoxins	20	RS ISO 16050
ii.	Aflatoxin B1	10	RS ISO 17375

6.2 Pesticide residues

Compounded trout feeds shall not exceed the pesticide residue limits established by the Codex Alimentarius Commission.

6.3 Heavy metals

Compounded trout feeds shall not exceed the limits for heavy metals given in Table 6 when tested in accordance with the test methods specified therein.

Table 6 — Heavy metal limits for Fish feed premix

S/N	Parameters	Maximum limits mg/kg	Test method
i.	Arsenic	2.0	

ii.	Lead	5.0	AOAC 985.01
iii.	Cadmium	1.0	
iv.	Mercury	0.1	

7 Packaging

Compounded trout feeds shall be packaged in suitable containers that are of sufficient strength and sufficiently sealed so as to withstand reasonable handling without tearing, bursting or falling open. The containers shall be clean and not previously used.

8 Labelling

Each package of compounded trout feeds shall be legibly and indelibly labelled with the following:

a) name of the feed as “Trout starter feed”, “Trout grower feed”, or “Trout brood stock feed”
b) name and address or contact information of manufacturer;
c) declared proportions of crude protein, crude fibre, crude fat, phosphorus, calcium, lysine and methionine;
d) net weight, in kilograms;
e) directions and precautions for use;
f) lot identification;
g) manufacturing date;
h) storage instructions; and
i) expiry date.

9 Sampling

Sampling shall be done in accordance with RS ISO 6497

Annex A
(normative)

Level of minerals and vitamins in compounded trout feeds

The table below indicates the micro-mineral and vitamin requirements for compounded trout fish feeds.

Table A.1 — Level of minerals and vitamins in compounded trout feeds (complete diet)

Minerals and vitamins	Level Units = mg/kg (dry basis) amount per kg of feed
Copper, min.	3 mg/kg
Zinc, min.	30 mg/kg
Manganese, min.	13 mg/kg
Iodine, min.	1 mg/kg
Iron, min.	60 mg/kg
Vitamin B12	0.02 mg/kg
Vitamin A, min.	2500 IU
Vitamin D, min.	2000 IU
Choline Min	800 mg/kg
Vitamin E	50 mg/kg
Riboflavin, min.	4 mg/kg
Pyridoxine	6 mg/kg
Pantothenic, min.	20 mg/kg
Biotin, min.	0.15 mg/kg
Folic, min.	2 mg/kg
Niacine, min.	10 mg/kg
Ascorbic acid, min.	40 mg/kg
Inositol	300 mg/kg
Thiamine	10 mg/kg

Price based on nnn pages